

Carlson Environmental Consultants, PC

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June 20, 2008

Mr. Ed Mussler, P.E.
Solid Waste Section Manager
NCDENR – Division of Waste Management
1646 Mail Service Center
Raleigh, NC 27699-1646



Subject: Request for NCDENR Division of Waste Management Approval
Maintenance and Modification of Existing Landfill Gas System
Henderson County Landfill – Hendersonville, NC
SW Permit No. 45-01

Dear Mr. Mussler:

On behalf of NC Municipal Landfill Gas, LLC (NC Muni), Carlson Environmental Consultants, PC (CEC) is submitting this request for approval from the North Carolina Department of Environment and Natural Resources (NCDENR) Division of Waste Management to maintain and modify an existing landfill gas (LFG) collection and control system at the Henderson County Landfill (Landfill) located near Hendersonville, North Carolina.

LANDFILL BACKGROUND

The Henderson County Landfill is a closed municipal solid waste (MSW) landfill located off Stoney Mountain Road near the town of Hendersonville, North Carolina. The facility is owned and operated by Henderson County, North Carolina. The Landfill has operated under SW Permit No. 45-01 and currently operates a construction and demolition (C&D) landfill and MSW transfer station. The site has three separate waste areas, a primary MSW waste mound that also has accepted C&D material as a vertical expansion, a smaller MSW mound, and then the original waste area that was used by the Tennessee Valley Authority (TVA).

The initial LFG collection and control system was installed by NC Muni in 1996 and 1997 in the primary waste mound. The initial LFG system included the use of vertical gas extraction wells, buried gas piping, gas blowers and filtration equipment, and a 1,250 scfm open flare. An approximate 2.5 mile landfill gas pipeline was installed in 1997 that routes collected gas to a boiler located at the Clement-Pappas facility (formerly a Seneca Juice Plant).

The Landfill is not subject to the New Source Performance Standards (NSPS) as listed in 40 CFR Part 60 – Subpart W/WW or the National Emission Standards for Hazardous Air

Pollutants (NESHAP) as listed in 40 CFR Part 61. Therefore, the existing LFG system is voluntary.

LANDFILL GAS SYSTEM MAINTENANCE AND MODIFICATION

As you are aware, LFG collection and control systems require consistent maintenance to maintain their effectiveness. LFG systems are impacted by landfill settlement, age, landfill operations, and other factors. It is fully expected that LFG system components will be required to be replaced, upgraded, and modified over time. Since the age of the LFG system at Hendersonville is over ten years old, significant maintenance and upgrades are now appropriate.

LFG Collection System Maintenance

Based on verbal guidance received from the NCDENR Solid Waste Section, NC Muni understands that NCDENR Solid Waste Section pre-approval of routine maintenance activities on existing LFG collection systems that have been permitted or reviewed by the NCDENR Solid Waste Section is not required. Routine maintenance is defined as the normal and routine activities that keep LFG systems operating in good working order. Maintenance items include replacement of existing gas wells, replacement of existing gas header and lateral piping, replacement of wellheads, repairs to existing gas wells or piping, maintenance and repairs to existing gas condensate features, repairs to LFG control equipment, etc. We further understand that construction documentation and professional engineer certification would be required, along with updated as-builts to be kept at the facility for review by NCDENR Solid Waste Section personnel, as needed. We understand that any new construction would need to be reviewed by the NCDENR Solid Waste Section for approval prior to construction beginning.

The LFG system maintenance construction activities planned for this site have been included in this submittal for your review and approval due to a specific request by Henderson County. NC Muni is unable to proceed with these important LFG maintenance items without your approval.

If the above description is not your understanding of the NCDENR Solid Waste Section position on the issue of LFG collection system maintenance activities on MSW and C&D landfills, please let us know.

Extraction Well Replacement and Installation

NC Muni is requesting approval from NCDENR to drill new gas extraction wells and replace existing gas extraction wells that have been impacted by various factors, including subsurface liquids, landfill settlement, landfill operations (including the C&D vertical expansion), and age. Additional locations have been identified that (based on site observations and well radius of influence) could utilize new gas wells. A drawing has

been attached to this letter (Figure 1) that shows the gas wells that NC Muni has targeted for replacement and installation. Please note that other gas wells may also be redrilled as part of this project or in the future.

NC Muni will be performing an assessment on the existing gas extraction wells that will include depth-to-water measurement, gas quality, well stem assessment, etc. The results from this assessment will be used to determine the number and extent of the replacements. All replacement wells will be installed adjacent to the existing gas wells (within 50 linear feet). The wells will be drilled and completed in accordance with existing LFG design standards, including: a minimum 24-inch bore hole, a minimum 6-inch diameter well casing (HDPE or SCH80 PVC), a minimum 24-inch bentonite seal (adjacent to the final cover layer), non-calcareous gravel/rock, and backfill soils. A typical gas well detail has been provided as Figure 2 (attached).

All wells will be installed to a depth to be determined based on available waste depths. All well drilling will be terminated at an elevation no deeper than ten feet above the base liner system (or the maximum waste depth as provided by the County). All waste removed from the well bores will be transferred to temporary containers that will be hauled to the on-site waste transfer station for ultimate disposal at an active MSW waste disposal facility. Well logs will be maintained and provided in the Certification Report.

NC Muni may also be installing impervious aprons (also called well bore seals) around the casing penetration point of selected gas wells. The purpose of these seals is to help prevent ambient air from entering the waste mass and the LFG system at the well locations. Depending on the quality of the soil cover, ambient air can be drawn into the waste mass at the well stem locations and can impact the quality of the LFG that is collected. These well bore seals would be constructed of synthetic plastic sheeting or bentonite clay and would be installed at a depth of approximately 12-inches around the well casing. The seals would extend to a diameter of approximately 10 to 15 feet around the wells. The cover soils would be replaced to existing condition.

Header and Lateral Piping Connections

NC Muni is requesting approval from NCDENR to install new and replacement LFG header and lateral piping for operation of the Landfill's existing LFG collection and control system. Once the new gas wells have been installed, NC Muni will connect them to the existing LFG collection system utilizing standard LFG construction methods and techniques. These include the use of high density polyethylene (HDPE) pipe, fittings, and gas wellheads. All piping will be solid and connected by HDPE fusion or physically connected by flange or flexible connection. A header and lateral cross section detail is provided as Figure 3.

The piping may be above or below-grade depending on the location. Above-grade piping will be secured in location by soil mounds or shallow staking. Above-grade piping will

be used in areas where excavation is impractical due to steep slopes, shallow soil cover, crossing surface water drainage features, or to comply with landfill operation requirements.

Below-grade piping will be installed in the soil vegetative cover with a minimum cover over the piping of four inches. A minimum distance of two inches of separation will be maintained between the piping and the impervious cap layer and/or waste. Should gas piping be required to be installed in waste or in the impervious soil cover layer, NC Muni will utilize bentonite clay or a bentonite mat to replace disturbed impervious cover soils. The vegetative soil cover will be replaced to existing conditions.

CONSTRUCTION QUALITY ASSURANCE

The construction will be monitored by construction quality assurance (CQA) personnel from a third-party engineering firm. The primary item that will be observed will be the header/lateral trenching in and on the Landfill's cover system and the gas well drilling. CQA personnel will document the existing conditions of the landfill soil cover through the use of photographs, cover thickness measurements, and visual observations of cover soils and vegetation. The replacement of these cover soils and vegetation will be in like and kind with what is existing at the start of construction.

Prior to trenching operations, NC Muni will perform a soil cover survey in the general locations of replacement buried LFG system header and lateral piping. The cover survey will involve excavating test pits to determine the available thickness of soil vegetative cover, impervious soil thickness, and depth to waste materials. This survey will allow the contractor and NC Muni to determine the burial depth of the LFG piping and whether below grade or on-grade piping will be most suitable. Photographs and visual documentation will be made during the soil cover survey. The cover soils will be replaced to pre-survey conditions at the conclusion of the test.

NC Muni will utilize experienced LFG system contractors and well drillers to perform all work. NC Muni will require the LFG contractor to take care in excavating the soil cover and installing the LFG system to prevent damage to the final cover system and will minimize damage to the vegetative cover system during construction. The contractor will be required to restore all trenched and disturbed areas of the cap to pre-construction conditions and will take all necessary precautions, such covering the trenches with plastic sheeting, to protect open trenches if precipitation occurs during daily construction activities or if trenches are left open overnight, and minimizing the use of heavy machinery on the landfill cap.

Gas well drilling will be documented to note the depth of each drilled gas well, the visual consistency of the removed waste, the waste temperatures, presence of any subsurface liquids, and the construction details of the new or replacement gas wells.

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NC Muni will have the LFG collection system modifications and well locations surveyed by a licensed North Carolina surveyor and this information will be incorporated in the existing LFG collection system site plan as-built drawing.

CONSTRUCTION DOCUMENTATION

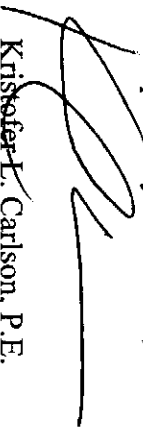
Upon completion of the LFG collection and control system modification, NC Muni will provide to the NCDENR Division of Waste Management and Henderson County as-builts of the LFG system as well as a Record Documentation Report. The Record Documentation Report will include (at a minimum) the following:

- A description of the construction work, parties involved, and materials and equipment used;
- Daily field logs from the CQA personnel as well as the contractor (as appropriate);
- Well drilling and completion logs;
- Photographs from the construction;
- As-built LFG system site plan drawing; and,
- Certification from a North Carolina Professional Engineer that construction was completed in accordance with the plans and specifications in this letter and generally accepted practices for LFG system construction.

CLOSING

If you have any questions or need additional information, please feel free to contact Bill Brinker with NC Municipal Landfill Gas, LLC at (704) 363-9664 or the undersigned at (704) 506-7312.

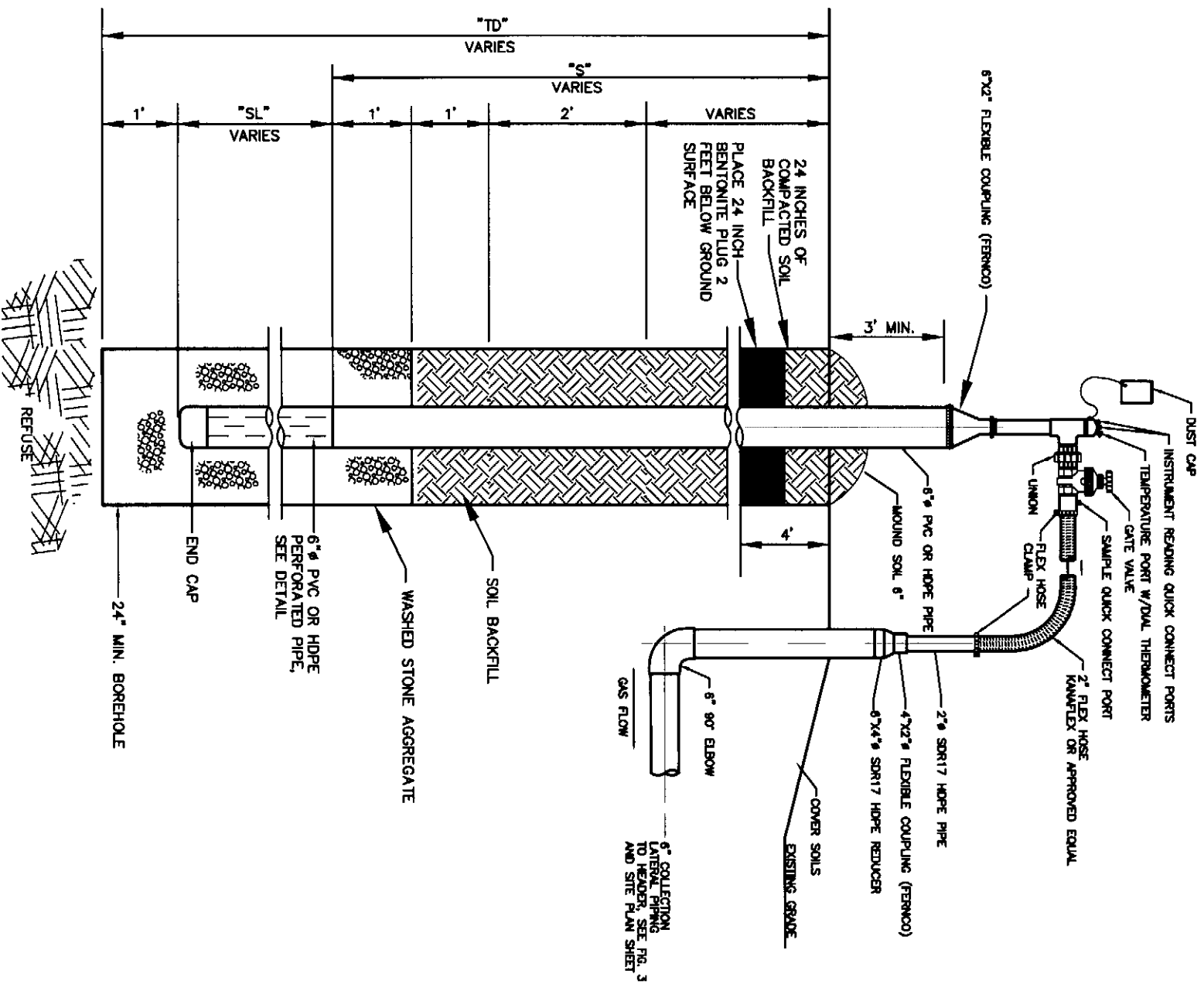
Respectfully Submitted,



Kristofer L. Carlson, P.E.
Principal
Carlson Environmental Consultants, PC

Attachments

cc: Bill Brinker, NC Muni
Marcus Jones, PE, Henderson County

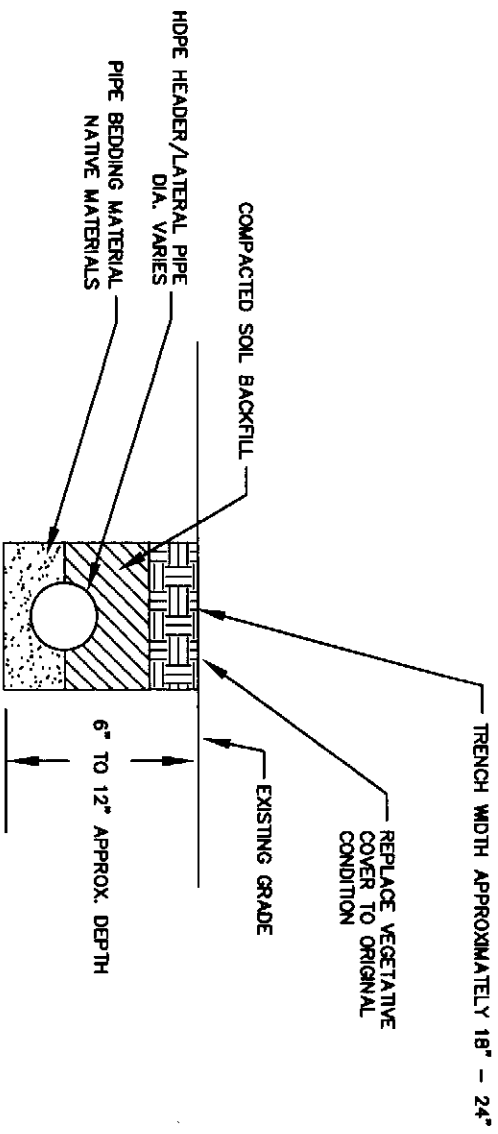


NOTE: DRAWING NOT TO SCALE

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FIGURE 2. PROPOSED LFG GAS WELL DETAIL

HENDERSON COUNTY LANDFILL - HENDERSONVILLE, NC



NOTE: DRAWING NOT TO SCALE

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FIGURE 3. PROPOSED LFG GAS LATERAL/HEADER DETAIL
HENDERSON COUNTY LANDFILL - HENDERSONVILLE, NC